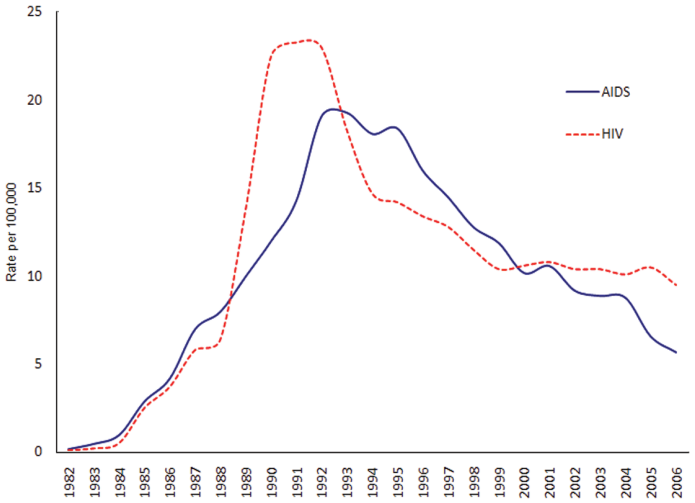
What is the scope of the HIV/AIDS epidemic in Virginia?

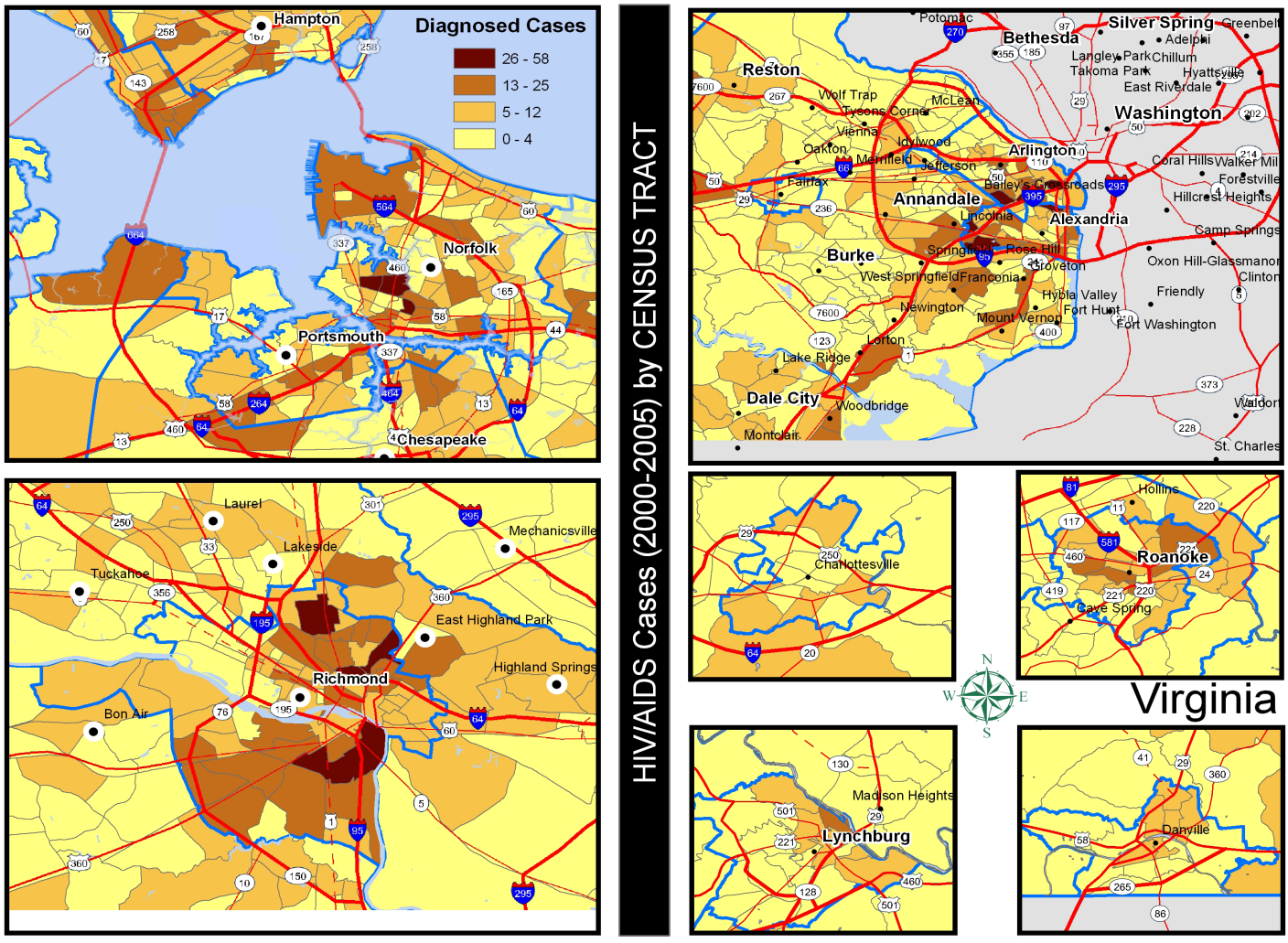
Figure 1 Virginia HIV/AIDS incidence rates (1982-2006)



In 2005, Virginia's population was 2.5% of the national total and had reported 3.9% of the cumulative reported cases of HIV. Also in 2005, Virginia ranked tenth highest in annual reported cases of HIV in the United States among States with confidential name-based reporting (KFF, 2007a). Between 1997 to 2006 the diagnosed cases of HIV/AIDS, in Virginia, has decreased from 1574 to 1190 [1190 | 1574]. However, the number of people living with HIV has steadily increased from 6,730 to 18,587 [6730 | 18587].

Gender

In 2006, the rate of HIV diagnoses was 14.8 per 100,000 among men compared to 5.6 per 100,000 among women. Men accounted for 72% of the

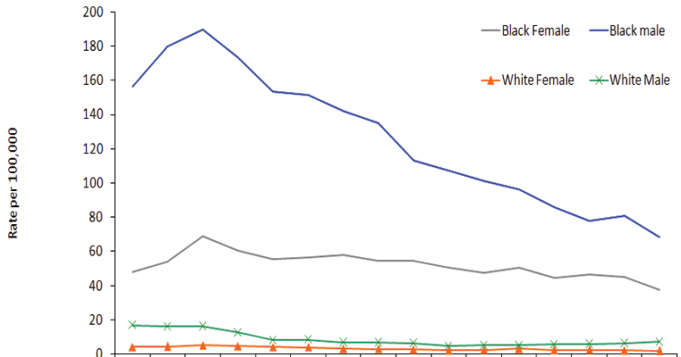


total diagnosed cases of HIV/AIDS in 2006.

Race

According to the Census Bureau (2006), an overwhelming majority of Virginians (71%) reported being White, approximately 20% reported Black and 6% reported Hispanic or Latino. Significant differences exist between rates of HIV among Blacks, and Whites (Figure 2). Blacks accounted for 64% of the total diagnosed cases of HIV/AIDS in 2006. In 2005, Black males were nine times (68.2 per 100,000) more likely to be diagnosed with HIV/AIDS compared to White males (7.2 per 100,000). Black females were 20 times (37.7 per 100,000) more likely to be diagnosed versus White females (1.9 per 100,000). Since 1992, the diagnosis rate among Black males has declined significantly from 189.8 per 100,000 to 68.2 in 2005. However, the diagnosis rates among Black females have not declined at a similar pace. In fact, since their peaks in 1992, diagnosis rates for Black males, White males, and White females had been cut in half by 2002. This has not yet occurred for rates in Black females. White males were the only group increasing in rates steadily over the past four years. Hispanics accounted for 8% percent of the total diagnosed cases in 2006 and were 4 times more likely to be diagnosed with HIV/AIDS compared to Whites. The rates of HIV/AIDS cases in 2006, were 46.8 per 100,000 among the Black population, 5.4 per 100,000 in the White population and 21.8 among the Hispanic population. Stable rates could not be calculated for Asians and Pacific Islanders or American Indian/Alaskan Natives due to the small number of diagnosed cases. In 2006, there were 15 diagnosed cases of HIV/AIDS among Asians and Pacific Islanders and one diagnosed case among American Indian/Alaskan Natives.

Figure 2 Virginia HIV/AIDS rates, by Race (1990-2005)

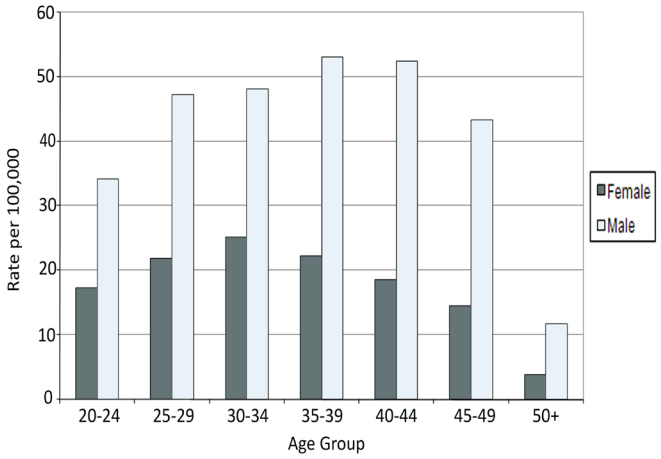


	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Black Female	48.0	53.8	68.8	60.3	55.5	56.3	58.1	54.7	54.5	50.5	47.4	50.5	44.4	46.7	45.0	37.7
Black male	156.2	179.6	189.8	173.1	153.1	151.3	141.8	134.7	113.2	107.3	101.1	96.1	85.8	77.9	81.0	68.2
White Female	4.1	4.4	5.2	4.8	4.3	4.0	3.3	3.0	2.7	2.1	2.5	3.2	2.5	2.5	2.1	1.9
White Male	16.9	16.1	16.4	12.5	8.1	8.5	6.9	6.9	6.4	4.8	5.1	5.1	5.7	5.9	6.5	7.2

Age at Diagnosis

Men accounted for 70% of all diagnosed cases of HIV/AIDS in 2005. During the same year men ages 20-29 were approximately two times more likely to be diagnosed with HIV than women in the same age group. Men aged 40 and older were three times more likely to be diagnosed with HIV than women. The largest number of diagnosed cases of HIV/AIDS occurred among persons aged 40-44, and accounted for 16% of the diagnosed cases in 2005 (Figure 3).

Figure 3 Virginia HIV/AIDS rates by age group and gender (2005)



Risks

In 2006, the largest proportion of HIV/AIDS diagnoses were among men who have sex with men (56%), followed by heterosexual contact (27%) and injection drug use (8%). From 2005 to 2006, the number of HIV/AIDS diagnoses decreased among men who have sex with men, heterosexuals and injection drug users.

Mortality Data

Advancements in antiretroviral therapies have slowed the progression of HIV infection to AIDS and have dramatically decreased the number of deaths from AIDS in Virginia. Table 1 shows the proportion of people still living with HIV five years after initial HIV diagnosis. From 1990 to 2001, the proportion of people living with HIV five years after initial diagnosis increased nearly 18%, from 77% in 1990 to 94.9% in 2001.

In 2003, the age-adjusted death rate for HIV in Virginia was 3.8 per 100,000 compared to the United States rate of 4.7 per 100,000 and was nearly 11 times lower than the highest HIV death rate reported in the District of Columbia (43.3 per 100,000). National data through 2005 indicates that Virginia had the twelfth highest number (8,550) of the reported deaths due to AIDS, representing 1.6% of the nationwide total. AIDS mortality data can be useful in understanding the impact of the epidemic on different populations. These differences may represent variations in access to care or in treatment strategies among groups. In 2006, there were 74 deaths reported from HIV. Consistent with the epidemic, 76% were Black and 72% were men. The most frequent age at death was between 40-49 years (38%), followed by 50 and older (31%).

Table 1 Percentage of people still living five years after HIV diagnosis

Year Diagnosed	Cases Diagnosed	Morbidity Status After 5 Years: Living	Deceased	Unknown^	Five Year Survival Rate^
1990	1397	1045	313	39	77.0%
1991	1468	1114	322	32	77.6%
1992	1475	1118	325	32	77.5%
1993	1193	925	247	21	78.9%
1994	966	817	131	18	86.2%
1995	950	819	110	21	88.2%
1996	908	836	60	12	93.3%
1997	875	804	54	17	93.7%
1998	792	733	48	11	93.9%
1999	727	672	48	7	93.3%
2000	756	696	56	4	92.6%
2001	781	737	40	4	94.9%

* Only cases reported as a Virginia HIV case and diagnosed in the years 1990 - 2001 were included in this analysis.

^ Unknown includes those cases with a current mortality status in HARS of unknown and those with a status of deceased but an unknown death date. The unknown cases were not used to calculate the survival rate.

HIV Testing

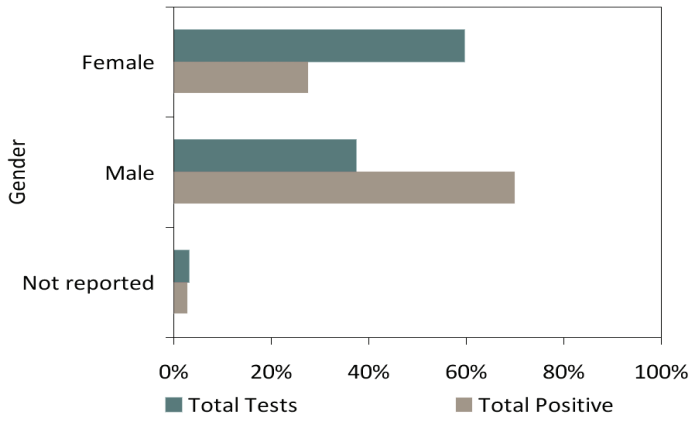
The Virginia Department of Health offers free confidential and/or anonymous HIV Counseling, Testing, and Referral (CTR) services in approximately 170 local health departments and clinics throughout Virginia. CTR services provided by these publicly funded sites include prevention counseling, HIV testing, explanation of test results and client and partner referrals. Clients are not required to have an HIV test and consent must be obtained before the test is performed. CTR data is test based which presents challenges when trying to distinguish the number of tests associated with individual clients. For these reasons, CTR data does not provide a good estimation of HIV prevalence.

Basic risk and demographic data is collected as part of CTR services. This data is used to provide a better understanding of the high risk behaviors and demographics associated with HIV infection. All CTR testing data provided in this section excludes those previously HIV positive based on self report. In 2006, there were 75,824 HIV tests conducted as part CTR services. Of the 75,824 HIV tests conducted, there were 398 positive for HIV, reflecting an overall positivity of 0.5%. The data described in this section is based on CTR data collected from January 1, 2006 – December 31, 2006.

Gender

There were significant differences found among males and females in the percentage of total HIV tests conducted and total HIV positive tests (Figure 4). In 2006, sixty percent of all HIV tests were among females. However, males constituted 70% of all positive HIV tests and overall positivity was highest among males (0.4%).

Figure 4 Percent of total HIV tests and total HIV positive tests by gender (January 1, 2006-December 31, 2006)



Race and Ethnicity

There were no significant differences found between the percentage of Blacks (44%) and Whites (37%) tested for HIV. However, Blacks made up 65% of the total number of HIV positive tests and overall positivity was highest among Blacks (0.3%).

Fifteen percent of the all HIV tests were among Hispanics. Of all HIV positive tests, nine percent were Hispanic. HIV positivity among Hispanics (total number of Hispanics positive for HIV compared to the total number of Hispanics tested for HIV) was 0.3%. However, Hispanics represented only 0.04% of the overall positivity (total number of Hispanics positive for HIV compared to the total number tested for HIV).

Age Group

Those between the ages of 20-29 represented the highest percentage of all HIV tests (47%), more than twice as high as any other age category. The percentage difference between age categories among HIV positive tests greatly decreased, with only a slightly higher number of positives among the 20-29 (34%) age group compared to the 30-39 (27%) and 40-54 (26%) age groups. Overall, HIV positivity among the age categories was also only slightly higher for those between 20-29 (0.18%) as compared to those between 30-39 (0.14%) and 40-54 (0.14%).

Risk

Five percent of all HIV tests were among men who have sex with men (MSM); however, thirty-eight percent of those positive for HIV were MSM. HIV positivity among MSM (number of MSM with a positive HIV test compared to the total number of MSM tested for HIV) was 4%, higher than any other single category. In terms of overall HIV positivity (total number of MSM positive for HIV compared to the total number tested for HIV), MSM risk represented 0.2%. Of all HIV tests, three percent were intravenous drug users (IDU) and, among all HIV positive tests, 4% were IDU. IDU represented only 0.02% of the overall HIV positivity.

HIV/AIDS Funding

In 2006, federal funding for HIV/AIDS totaled $2,839,010,780. Virginia received $40,619,223, which was 1.43% of the total federal funding (KFF,2007b). Virginia uses federal and state general funds to conduct HIV prevention across the state. The 2007 calendar year plus 2008 state fiscal funds totaled $2,541,000 for HIV prevention in Virginia. This includes direct prevention services and community based testing but does not include health department based testing. The majority of this funding was distributed to the Central Health Region (30.2%) followed by Eastern (25.3%), Northern (20.5%), Northwest (16.6%) and Southwest (7.3%).

Late Diagnosis of HIV

Early knowledge of HIV infection can improve an individual's health outcomes, help prevent further HIV transmission in vulnerable populations, and reduce health care costs associated with a progression to AIDS. Therefore by understanding the characteristics of people diagnosed "late" in the progression of HIV infection, it may be possible to better target services.

Using a methodology from the Washington State Department of Health, we examined HIV surveillance data in Virginia to compare two groups of people testing positive for HIV: those who test early versus late in the progression of their infection. The early diagnosis group was defined as cases of HIV infection that were initially diagnosed between 2001 and 2005 and had not received an AIDS diagnosis as of 2005. The late diagnosis group was defined as cases of HIV infection over the same time period that received an AIDS diagnosis within 12 months of their initial HIV diagnosis. In order to statistically compare the characteristics of the two groups, an odds ratio for five surveillance variables was calculated: age at initial HIV diagnosis, sex, race, health region, and risk group. We chose the 20-29 age group, male, White, Northern, and men who have sex with men (MSM) as the comparison category within each variable, respectively.

From 2001-2005, 3,231 (88.4%) cases of HIV were diagnosed early whereas 421 (11.6%) were late diagnoses in Virginia. Table 2 shows the results of the analysis. These results indicated that people in each of the three older age categories were more likely to test late (68%, 94%, and 88% respectively) than people in the 20-29 year old category. Hispanics and Blacks were the only groups with data available for reliable statistical testing in this analysis. Hispanics were 98% more likely to test late than Whites. Those indicating a heterosexual risk factor were 35% more likely to test late than those identifying as MSM. Sex and health region were not identified as significant factors in the analysis.

Table 2. Early vs. Late HIV Diagnoses, Virginia

	Early Diagnosis		Late Diagnosis		Crude Odds Ratio (95% CI)	
	No.	%	No.	%	**BOLD** = significant	
Total	3231	100%	421	100%	NA	NA
Age at Initial HIV diagnosis						
<20	163	5.0%	6	1.4%	0.43	(0.18-0.99)
20-29	914	28.3%	79	18.8%	Reference	Reference
30-39	1058	32.8%	154	36.6%	**1.68**	**(1.27-2.24)**
40-49	746	23.1%	125	29.7%	**1.94**	**(1.44-2.61)**
>50	350	10.8%	57	13.5%	**1.88**	**(1.31-2.71)**
Sex						
Male	2209	68.4%	299	71.0%	Reference	Reference
Female	1022	31.6%	122	29.0%	0.882	(0.71-1.10)
Race						
White	852	26.4%	91	21.6%	Reference	Reference
American Indian/Alaskan Native*	4	0.1%	1	0.2%	2.34	(0.26-21.17)
Asian*	32	0.99%	8	1.90%	2.34	(1.05-5.23)
Black	2095	64.8%	271	64.4%	1.21	(0.94-1.56)
Hispanic	232	7.2%	49	11.6%	**1.98**	**(1.36-2.88)**
Unknown*	16	0.5%	1	0.2%	0.59	(0.08-4.47)
Region						
Northern	785	24.3%	108	25.7%	Reference	Reference
Central	847	26.2%	119	28.3%	1.02	(0.77-1.35)
Eastern	1151	35.6%	149	35.4%	0.94	(0.72-1.23)
Northwest	190	5.9%	24	5.7%	0.92	(0.57-1.47)
Southwest	258	8.0%	21	5.0%	0.59	(0.36-0.96)
Risk Groups						
Group 1 (MSM)	1187	40.4%	165	45.1%	Reference	Reference
Group 2 (Hetero)	593	20.2%	111	30.3%	**1.35**	**(1.04-1.75)**
Group 3 (NIR)	1162	39.5%	90	24.6%	0.56	(0.43-0.73)

Health Disparities and Planning in Virginia: Poverty, HIV/AIDS, and Sexually Transmitted Diseases

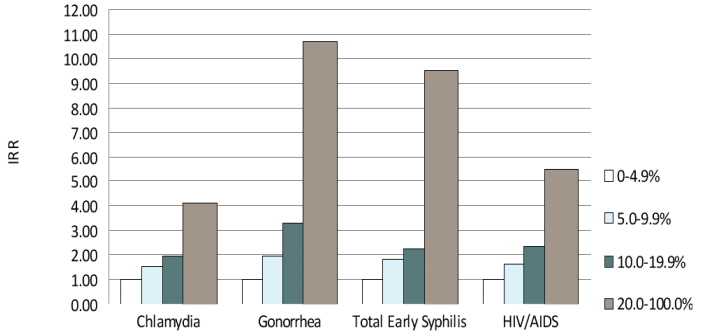
In Virginia, there is a lack of consistent socioeconomic indicators collected through routine HIV and STD surveillance. Without this data, it is impossible to monitor how socioeconomic indicators, such as poverty, impact prevalence of HIV and STDs. Typically, states present data on poverty and HIV/STDs in their Epidemiology Profiles. Rarely is this data connected to show the relationship between poverty and infection. The methods outlined in The Public Health Disparities Geocoding Project were used to analyze reported cases of HIV/AIDS, Total Early Syphilis, Gonorrhea and Chlamydia from 2000-2005. Reported cases were geocoded and then appended to area-based socioeconomic case records. These records were then stratified into discrete poverty categories (0-4.9%, 5-9.9%, 10-19.9%, 20.0-100%) and numerators and denominators were aggregated over areas within the defined levels of poverty. Age standardized rates and gamma confidence intervals were calculated for each disease and poverty level. Incidence Rate Ratios (IRR) were calculated comparing the highest level of poverty to the lowest.

As the proportion of the population living in poverty increased, so did the age-adjusted incidence rates for chlamydia, gonorrhea, total early syphilis and HIV. The rates and 95% confidence intervals are presented in Table 3. Using the least impover-

ished stratum (0-4.9%) as the reference category, the IRRs showed significant risk increase across subsequent stratum. The census tracts where the highest proportion of people lived below poverty (20-100%) had 4.09, 10.69, 9.51 and 5.52 times increased risk for chlamydia, gonorrhea, total early syphilis and HIV, respectively. IRRs for all stratum with 95% confidence intervals are presented in Figure 5.

From this analysis, we can determine that there is quantitative evidence of socioeconomic disparity in the diagnosis of HIV/STDs at the census tract level in Virginia. The results from this analysis can be used to allocate resources to high priority populations.

Figure 5 Incidence Rate Ratios and 95% confidence intervals for HIV/STDs in Virginia, (2000-2005), by poverty stratum



0-4.9%	1.00 (ref)	1.00 (ref)	1.00 (ref)	1.00 (ref)
5.0-9.9%	1.55 (1.52-1.59)	1.94 (1.87-2.01)	1.82 (1.49-2.24)	1.62 (1.50-1.74)
10.0-19.9%	1.97 (1.93-2.01)	3.28 (3.17-3.39)	2.26 (1.85-2.75)	2.32 (2.16-2.49)
20.0-100.0%	4.09 (4.00-4.17)	10.69(10.35-11.06)	9.51 (7.89-11.47)	5.52 (5.13-5.95)

Table 3 Total diagnosed cases (N) and age-standardized incidence rates per 100,000 (with upper and lower 95% gamma confidence intervals) for STDs and HIV in Virginia (2000-2005), aggregated by four stratum of poverty.

Case	N	0-4.9%			5.0-9.9%			10-19.9%			20-100%		
		n	%	Rate (95% CI)	n	%	Rate	n	%	Rate	n	%	Rate
Chlamydia	111,947	14,014	16.6	108.2 (106.4-110.1)	19,779	23.5	168.4 (166.1-170.8)	25,238	29.9	213.5 (210.9-216.2)	25,147	29.9	442.8 (437.2-448.5)
Gonorrhea	54,433	4,505	10.2	33.6 (32.6-34.6)	7,858	17.8	65.4 (63.9-66.8)	13,012	29.5	110.3 (108.4-112.2)	18,585	42.7	360.4 (355.1-365.8)
Total Early Syphilis	1,168	158	15.0	1.0 (0.86-1.2)	236	22.4	1.9 (1.6-2.1)	266	25.3	2.3 (2.0-2.6)	392	37.2	9.7 (8.7-10.7)
HIV	7,608	1,226	18.3	7.9 (7.5-8.4)	1,653	24.7	12.7 (12.2-13.4)	2,107	31.4	18.3 (17.6-19.1)	1,707	25.5	43.6 (41.6-45.8)

REFERENCES

Census Bureau (2006). Virginia Quick Facts. U.S. Census Bureau. Retrieved, June, 29, 2007 from the U.S. Census Bureau website: www.census.gov.

CDC and HRSA (2004). Integrated Guidelines for Developing Epidemiologic Profiles: HIV Prevention and Ryan White CARE Act Community Planning. Atlanta, Georgia: Centers for Disease Control and Prevention; 2004. Retrieved on October 28,2007 from http://www.cdc.gov/HIV/projeCTR/epi_guide/epi_guidelines.pdf

KFF (2007a). HIV Infection Cases Reported in 2005 among States with Confidential Name-Based Reporting. Retrieved on November 10, 2007 from http://www.statehealthfaCTR.org/comparemaptable.jsp?ind=524&cat=11&yr=1&typ=2&sort=n&o=d

KFF (2007b). Total HIV/AIDS Federal Funding FY2006. Retrieved on October 23, 2007 from: http://www.statehealthfaCTR.org/comparetable.jsp?ind=528&cat=11

SEXUALLY TRANSMITTED DISEASES

According to the CDC, individuals who are infected with STDs are at least two to five times more likely than uninfected individuals to acquire HIV if they are exposed to the virus through sexual contact (CDC). In Virginia, gonorrhea, chlamydia and syphilis are reportable conditions and because STD rates are reliable indicators of high-risk behavior, groups with high rates of STDs are potentially at increased at risk for HIV infection.

Chlamydia

From 1996 to 2006 the statewide rate of reported cases of chlamydia has increased 77% from 179.4 to 318.2 per 100,000 [179 | 318]. In 2006, the rate of Chlamydia reached an 11 year high in both women (460.1 per 100,000) and men (171.2 per 100,000). Women accounted for 73% of the total reported cases of chlamydia, mirroring nationwide trends due to increased screening among females. The largest rate of reported cases occurred among persons aged 20-29 (1,259.2 per 100,000) and accounted for 55% of the reported cases (Figure 6). Significant disparities in the rates of chlamydia exist between Blacks and Whites. Blacks were 9.1 times more likely to be reported with chlamydia than Whites. The highest rate of chlamydia was in the Eastern region (744.5 per 100,000), having more than double the state rate, followed by Central (469.9 per 100,000), Northwest (215.8 per 100,000), Northern (180.3 per 100,000), and Southwest (142.1 per 100,000).

Gonorrhea

In 2001, the reported rate of gonorrhea reached a

Figure 6 Virginia chlamydia rates, by Age Group (1996-2006)

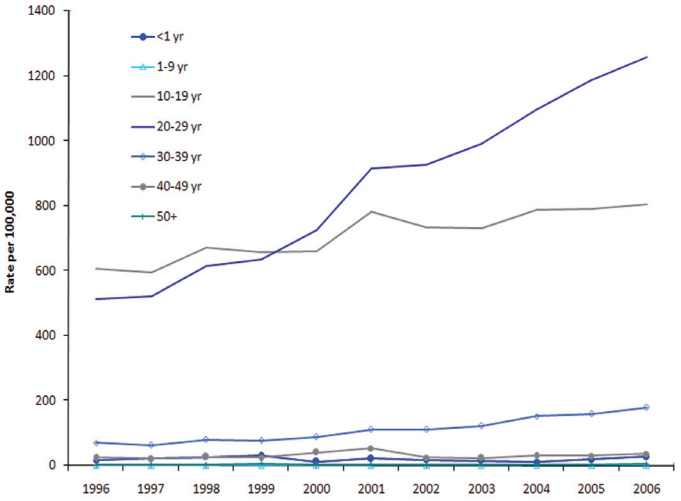
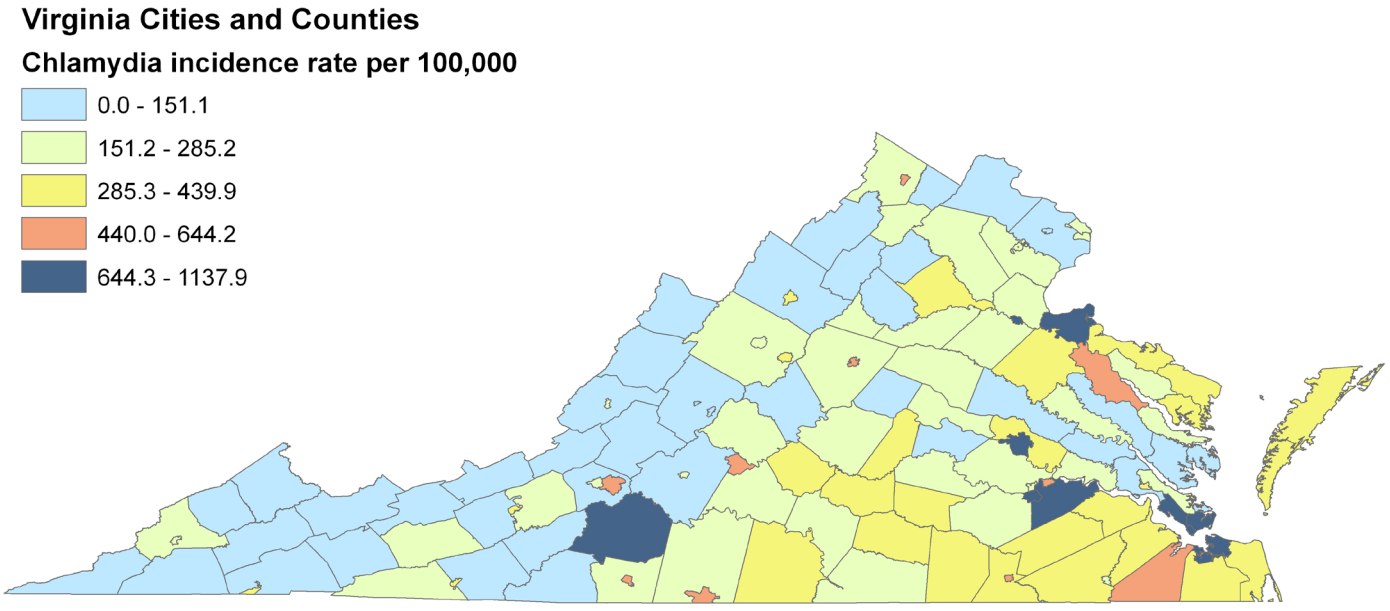


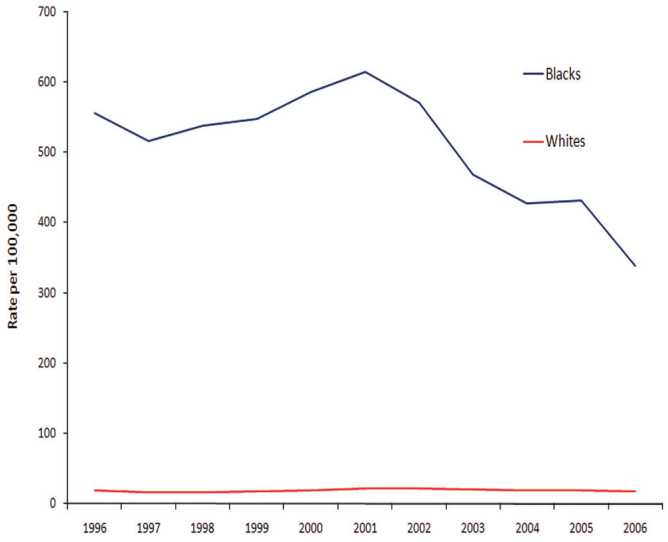
Figure 7 Virginia chlamydia incidence rates (2006)



*Cases of Chlamydia diagnosed in Virginia in 2006. Population data from US Census Bureau (2005)

peak of 154.2 per 100,000 and since then has decreased 44% to 85.6 per 100,000 in 2006 [86 | 154] .In 2006, the rate of gonorrhea was almost identical in women (85.6 per 100,000) and men (85.5 per 100,000). The largest rate of reported cases of gonorrhea occurred among persons aged 20-29 (317.0 per 100,000), which accounted for 51% of the reported cases . Significant disparities in the rates of gonorrhea exist between Blacks and Whites. Blacks were 18.9 times more likely to be reported with gonorrhea than Whites (Figure 8). The highest rates of gonorrhea were in the Eastern (206.0 per 100,000) and Central (167.0 per 100,000) regions followed by the Southwest (48.2 per 100,000), Northwest (32.8 per 100,000) and Northern (24.8 per 100,000) regions.

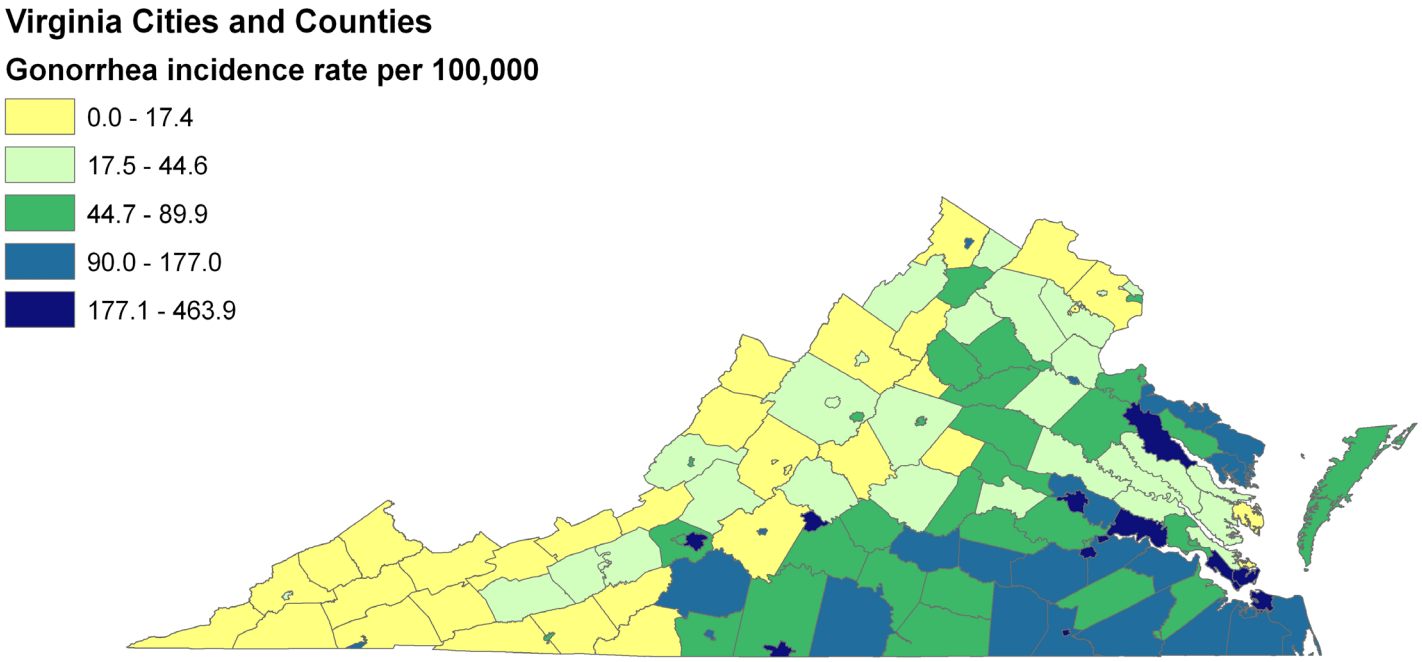
Figure 8 Virginia gonorrhea rates, by race (1996-2006)



Total Early Syphilis (TES)

From 1996 to 2006, the statewide rates of reported cases of total early syphilis among women have

Figure 9 Virginia gonorrhea incidence rates (2006)



*Cases of gonorrhea diagnosed in Virginia in 2006. Population data from US Census Bureau (2005)

steadily decreased [1 | 12]. Among men, during the same time period, rates reached a low of 3.7 per 100,000 in 2001 and since then have steadily increased [3 | 12]. In 2006, the rate of total early syphilis was almost 6 times higher in men (8.0 per 100,000) than women (1.4 per 100,000). From 2001 to 2006, the male to female ratio has continued to widen (Figure 10). This is attributable to an increase in outbreaks among MSM. It is also known that the lesions associated with syphilis make it easier to transmit HIV infection sexually (CDC). Thirty percent of people reported with total early syphilis were also coinfected with HIV. The highest rate of total early syphilis occurred among persons aged 20-29 (12.1 per 100,000), accounting for 36% of the reported cases. Significant disparities in the rates of total early syphilis exist between Blacks and Whites. Blacks were 7.4 times more likely to be reported with total early syphilis than Whites. The highest rate of total early syphilis was in the Eastern (12.0 per 100,000) region, followed by Northern (5.3 per 100,000), Central (5.2 per 100,000), Northwest (1.4 per 100,000) and Southwest (1.0 per 100,000).

Figure 10 Virginia total early syphilis rates, by gender (1996-2006)

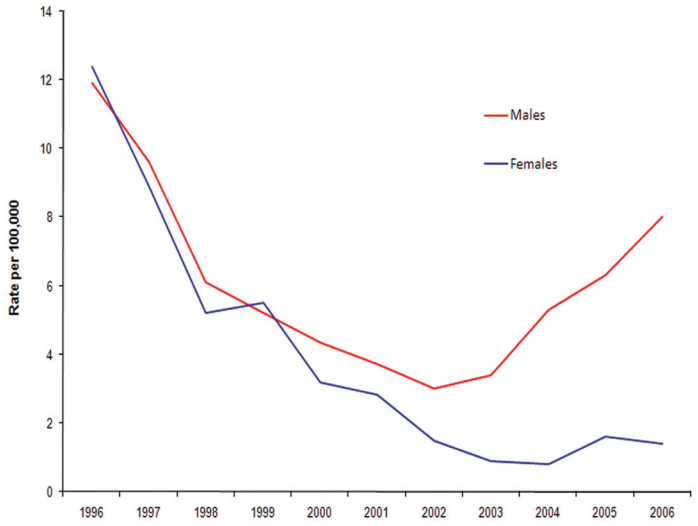
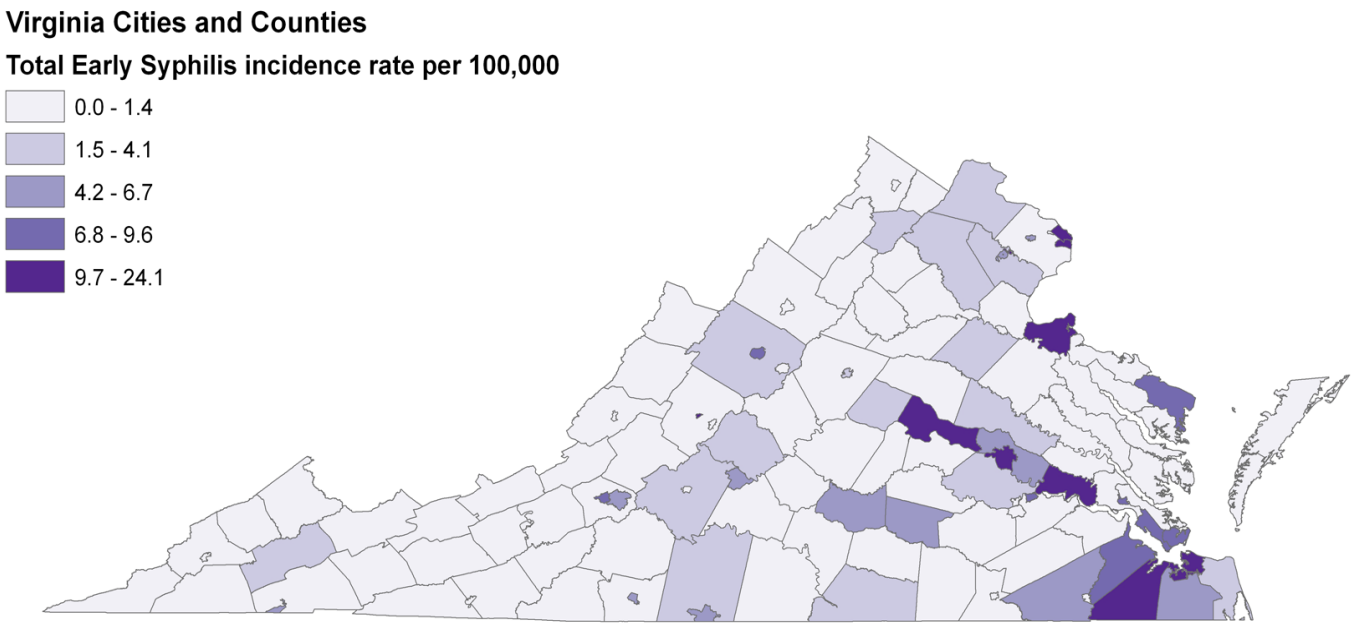


Figure 11 Virginia total early syphilis incidence rates (2006)



*Includes a diagnosis of Primary Syphilis, Secondary Syphilis or Early Latent Syphilis diagnosed in Virginia during 2006. Population data from US Census Bureau (2005)